

Application Serial No. 10/791,187

Attorney Docket No.: 076838-138901/US

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Freddie W. Smith et al.	Examiner:	GEORGE A. BUGG
Serial No.:	10/791,187	Group Art Unit:	2612
Filed:	March 1, 2004	Confirmation:	3185
Title:	REMOTE COMMUNICATION DEVICES, RADIO FREQUENCY IDENTIFICATION DEVICES, WIRELESS COMMUNICATION SYSTEMS, WIRELESS COMMUNICATION METHODS, RADIO FREQUENCY IDENTIFICATION DEVICE COMMUNICATION METHODS, AND METHODS OF FORMING A REMOTE COMMUNICATION DEVICE		

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

"PROPOSED"**AFFIDAVIT UNDER 35 C.F.R. 1.131**

I, John Patrick Ward, hereby declare that:

- 1) I am a citizen of the United States of America and currently a resident of the town of Los Gatos in the state of California.
- 2) I am a patent attorney in the law firm of Greenberg Traurig, LLP, and a member of the California Bar. I am registered to practice before the United States Patent and Trademark Office. I and other members of my firm represent the assignee of the above referenced patent application, Keystone Technology Solutions, LLC.
- 3) I believe that prior to February 27, 1999 the inventors, Freddie W. Smith and Dirgha Khatri, conceived of the invention as described and claimed in the above referenced patent application.

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- 4) The above referenced patent application is a continuation application of the parent application Serial No. 09/389,534, filed on September 2, 1999.
- 5) I believe on January 8, 1999, as evidenced by the attached Exhibit A, a copy of the invention disclosure form entitled "Dual Frequency RFID Tag" was assigned to a law firm, Wells, St. John, Roberts, Gregory & Matkin P.S., which represented the assignee of the parent application, Micron Technology, Inc., to prepare the parent application Serial No. 09/389,534. Exhibit B shows a copy of the invention disclosure form entitled "Dual Frequency RFID Tag."
- 6) I believe on August 11, 1999, as evidenced by the attached Exhibit C, a complete copy of the parent application of the above referenced application was forward to the inventors for review, in addition to requesting inventor signatures for filing the parent application of the present application.
- 7) I believe on August 25, 1999, as evidenced by the attached as Exhibit D, the request of August 11, 1999 for inventor signatures for filing the parent application of the present application was repeated.
- 8) The parent application Serial No. 09/389,534 was filed on September 2, 1999 without inventor signatures.
- 9) I declare, to the best of our knowledge, all statements made in this document are true, and that all statements made on information are believed to be true; and further, that these statements were made with the knowledge that willful false statements are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the above-identified patent application or any patent issued thereon.

Application Serial No. 10/791,187

Attorney Docket No.: 076838-138901/US

Respectfully submitted,

Date: _____

John P. Ward
Reg. No. 40,216

Customer Number 64494
GREENBERG TRAURIG, LLP
(650) 328-8500 Telephone
(650) 328-8508 Facsimile

Exhibit A



January 8, 1999

*Mark S. Matkin
Wells, St. John, Roberts, Gregory & Matkin P.S.
601 West First Avenue, Suite 1300
Spokane, WA 99201-3817*

*Re: Micron Ref. No. 97-0668
ENHANCED PRINTED CIRCUIT, LOADED LOOP ANTENNA*

*Micron Ref. No. 97-1389
DUAL FREQUENCY RFID TAG*

*Micron Ref. No. 97-1394
METAL SURFACE RFID TAG*

Dear Mark:

The above-referenced disclosures have been assigned to your docket. Please prepare and file patent applications with the U.S. Patent and Trademark Office on behalf of Micron Technology, Inc. Where possible, please draft system, product, and process claims.

If you have any questions, or if I may be of further assistance, please do not hesitate to call.

Very truly yours,

A handwritten signature in dark ink, appearing to read "Susan Jerome", is written over the typed name.

*Susan Jerome
Patent Assistant*

*Phone: (208) 368-4508
Fax: (208) 368-5606*

Exhibit B

Thursday, 11/20/97

patent copy

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Page 1

DEC 01 1997

If ARPA project

please check below:

INVENTION DISCLOSURE

☐ Advanced SRAM☐ BST☐ FED☐ FE RAM☐ NCAICM

97-1389

1. INVENTOR (S): Freddie W. Smith
Dirgha Khatri

2. DESCRIPTION

2.1 Title of invention: Dual Frequency RFID Tag

2.2 Brief description: An RFID Tag has been developed which can operate at either of two frequencies: 915MHz or 2.45 GHz.

2.3 Also attach a complete description, including drawings or sketches and articles relevant to the invention. (If not sure, give the earliest date of which you are sure.)

The Micron Communications RFID(Radio Frequency Identification) tag has been modified so that it can now be used at two frequencies i.e. at 915 MHz and 2.45 GHz. The new RFID tag uses two antennas, one to receive a message from a tag reader(the receive antenna) and one to send a reply to the tag reader (the backscatter antenna).

The new tag design started by first designing a 915 MHz tag. For lower frequency the size of the antenna increases because of the longer wavelength. The goal was to design a 915 MHz tag as the same size or smaller than the size of the 2.45 GHz RF Module on a 32 mils thick FR4 board. The RF Module is the size of a credit card.

The tag receive antenna is a loop antenna which is connected to the RX Input(pin 7) of the SOIC. The size of the loop antenna is 30mm X 30mm with thickness of 1 mm. With this size, the antenna is tuned to higher frequency than 915 MHz. Hence the battery with the clip is laid out on the center of the loop. This creates a capacitive loading on the antenna and tunes it down close to 915 MHz. Also to operate the same antenna at 2.45 GHz a thin strip is added on the lower right hand corner of the antenna which enhanced the performance at 2.45 GHz without degrading at 915 MHz. See Figure 1.

The tag backscatter antenna is connected to BS1(pin 5) and BS2(pin 6) of SOIC. The backscatter antenna is a dipole antenna with each arm length spread horizontally to $\lambda/4$ (26mm) where λ is the wavelength at 2.45 GHz frequency. In order to tune it to 915 MHz also, the same antenna is extended upward and 50 mm of length is added such that the total length on each arm is close to $\lambda/4$ (80mm) where λ is the wavelength at 915 MHz frequency. The thickness of the dipole arm is ~ 3mm.

With this design the new RFID tag can be used at 915 MHz as well as 2.45 GHz. The tag range assuming FCC allowable output from the interrogator, at the two frequencies is given below:

Frequency	Forward Range(Feet)	Return Range(Feet)
915 MHz	170	300
2.45 GHz	28	90

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patent.copy

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The advantage of this design is not only it can operate at dual frequencies but also maintain a small size. The size of the tag is 60 mm length and 53mm in width which is smaller than the RF engine module (credit card size).

3. INFORMATION CONCERNING CONCEPTION OF INVENTION

3.1 CONCEPTION AND DOCUMENTATION OF THE INVENTION

- a. Identify the date when you first conceived the invention. (If not sure, give the earliest date of which you are sure.)

October 29, 1997

- b. To whom was the idea first described and on what date? (Other than a co-inventor.)

Cliff Wood

- c. Identify the date of the first record such as computer simulation, tape out, drawing or written description. Please specify type and location.

October 29, 1997, Lab Notebook, Dirgha Khatri's office

3.2 CONCEPTION OF THE INVENTION

- a. Please identify related invention disclosures, patents or other publications describing similar ideas, and other companies working in the same field. Attach copies, if available.

1. RFID Tag Range Performance Enhancement with Phase Tuned Back Scatter Antenna.
2. Increased Range RFID Tag.
3. Texas Instruments.
4. Amtech

- b. What is the closest technology, of which you are aware?

RFID Tags that use one frequency for receive and another frequency for transmit.

- c. Identify the advantages of this invention over previous technology.

The dual frequency RFID Tag can operate at two independent frequency bands. This allows the user to choose which frequency meets his/her needs. If one band has severe interference then the other band can be used. Due to propagation characteristics the tag can function at much greater range with the 915MHz band. Reduces costs since a single tag can be used at multiple frequencies.

3.3 IMPORTANT DATES

- a. Has the invention been disclosed outside the company? No
If yes, to whom, when, and in what form?

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patent copy

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b. Have any articles describing your invention been published? No
If yes, list author (s), title of article, publication and date.

c. Have any engineering samples been given out? No If yes, to whom
and on what date?

d. Has any product using the invention been sold or offered for sale?
No If yes, to whom and on what date?

3.4 DISPOSITION OF THE INVENTION

a. When will (or did) Micron begin use of the invention experimentally?
October 29, 1997

b. When will (or did) Micron begin production of this invention?
Unknown

3.5 MISCELLANEOUS INFORMATION

a. Was the invention developed during a joint development agreement or other
contract with an outside company? No

b. Please list developmental work outside the company (including Government
proposal or contract).

4. INVENTORS

Name: Freddie W. Smith

Micron Phone: 208-333-7331 Micron Mail Stop: 941

Company Name (VERY IMPORTANT): Dept. Name: R & D Systems
Micron Semiconductor, Inc. Dept. #: 566
Micron Computer, Inc.
Micron Custom Manufacturing Services, Inc.
Micron Display Technology, Inc.
X Micron Communications, Inc.
Other

Home Address: 9945 W. Quailstone Ct.
Boise, ID 83709

Citizenship: USA

Supervisor: Cliff Wood

Signature: Freddie W. Smith Date: 11/20/97

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Thursday, 11/20/97

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Page DEC 18 2008

Name: Dirgha Khatri

Micron Phone: 208-333-7415

Micron Mail Stop: 941

Company Name (VERY IMPORTANT):

Dept. Name: R & D Systems

____ Micron Semiconductor, Inc.

Dept #: 566

____ Micron Computer, Inc.

____ Micron Custom Manufacturing Services, Inc.

____ Micron Display Technology, Inc.

☒ Micron Communications, Inc.

____ Other

Home Address: 2401 South Apple St.
Apt. E207
Boise, ID 83706

Citizenship: Nepal

Supervisor: Cliff Wood

Signature: [Signature] Date: 11/20/97

5. WITNESS

If there is only one inventor, a witness should sign and date this disclosure. A witness in this case is a non-inventor who understands the nature of the invention.

[Signature]
(Signature of Witness)

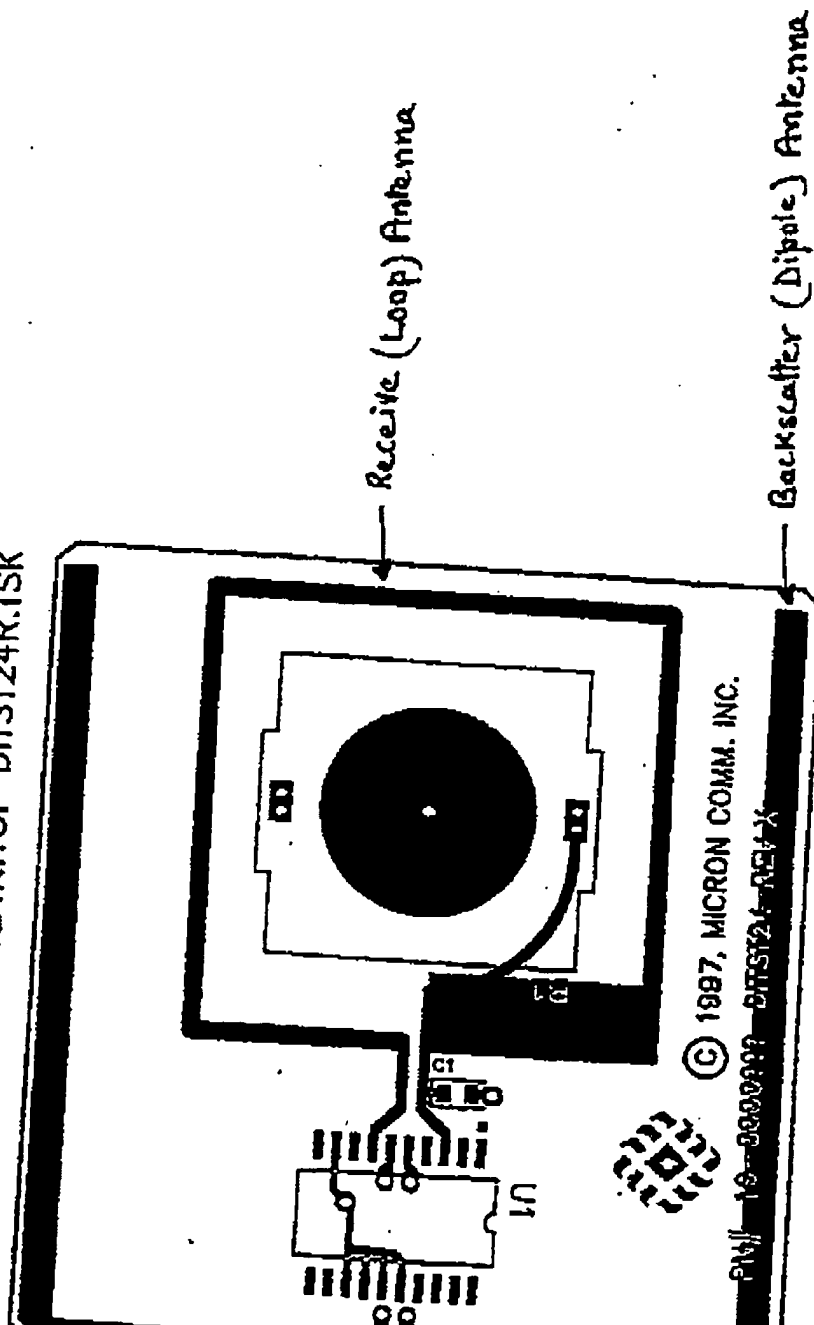
11-20-97
(Date)

Note: If you have any questions or wish assistance completing this form, please call the Legal/Patent Department, ext. 4527.

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TOP SIGNAL TOP SILK SCREEN
DITST24R.TOP DITST24R.TSK

FIG. 1



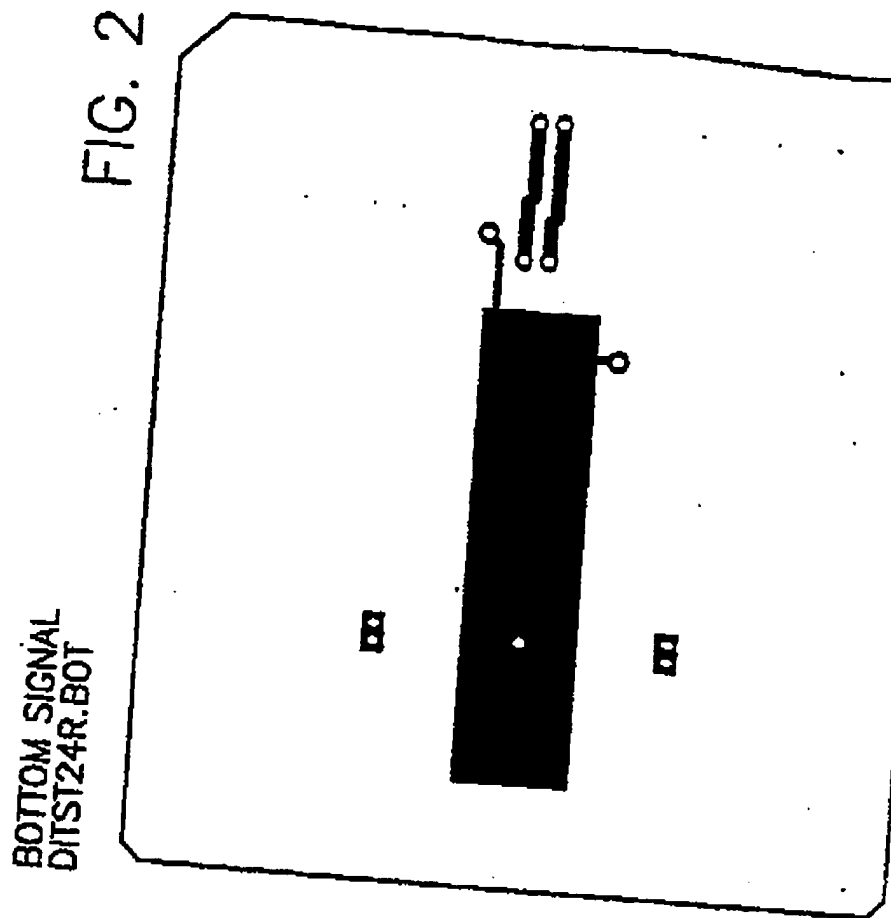


Exhibit C

Wells, St. John, Roberts, Gregory & Matkin P.S.**Attorneys-at-Law**

Randy A. Gregory
Mark S. Matkin
Mark W. Hendricksen
Deepak Malhotra
George G. Grigel
Keith D. Grzelak
David G. Latwesen, Ph.D.

Patents, Trademarks and Copyrights

601 West First Avenue, Suite 1300
Spokane, Washington 99201-3828 U.S.A.

Tel: (509) 624-4276

Fax: (509) 838-3424

James D. Shaurette
Fritz M. Fliegel, Ph.D.
Thomas A. Olson
D. Brent Kennedy
James L. Price*

* Patent Agent
Admitted to MI Only

Greek Wells (1897-1980)

August 11, 1999

Of Counsel
Richard J. St. John
David P. Roberts

Ms. Monica Kesling
Micron Communications, Inc.
8000 South Federal Way
Boise, ID 83706-9632

Re: U.S. Patent Application
"Remote Communication Devices, Radio Frequency
Identification Devices, Wireless Communication Systems,
Wireless Communication Methods, Radio Frequency
Identification Device Communication Methods, and
Methods of Forming a Remote Communication Device"
Your Reference: 97-1389
Our Reference: MI40-195

Dear Monica:

Enclosed is a complete copy of the above patent application, together with a Declaration, Assignment and Power of Attorney by Assignee. If the application correctly presents the invention, please see that the Declaration and Assignment are signed where indicated by each inventor. Please be reminded that, according to PTO rules, an inventor's signature on the Declaration must appear *exactly* as it is typed. Should the application require revision, please contact me. The Power of Attorney by Assignee and Certificate by Assignee should be executed on behalf of Micron Communications after execution of the application papers by the inventors.

Our patent laws require that the application be filed in the PTO within one year of the first public or commercial use of the invention, its first disclosure in a printed publication, or the first offer of a product of the invention for sale. Any such events should be called to my attention.

Also, everyone involved in filing a patent application has a duty to disclose pertinent background information (prior art) on the invention to the PTO. We are required to disclose all prior art that the PTO might consider pertinent in evaluating patentability of the invention. Failure to do so can jeopardize the validity of an issued patent.


*Ms. Monica Kesling
August 11, 1999*

*Wells, St. John, Roberts,
Gregory & Matkin P.S.*

We will mail you a complete copy of the signed version of the application within a few days after it is filed with the Patent and Trademark Office.

We appreciate the opportunity to serve you in preparing this application. Please call if you have any questions.

Very truly yours,



James D. Shaurette

JDS:plp

*Enclosures: Draft Patent Application and Drawings; Declaration; Assignment; Power of Attorney
by Assignee*

*Copy: Freddie W. Smith (w/application and drawings)
Dirgha Khatri (w/application and drawings)
Michael L. Lynch, Esq. (w/application and drawings)*

Exhibit D

Wells, St. John, Roberts, Gregory & Matkin P.S.
Attorneys-at-Law

Randy A. Gregory
Mark S. Matkin
Mark W. Hendricksen
Deepak Mahtotra
George G. Grigel
Keith D. Grzelak
David G. Larwesen, Ph.D.

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Früz M. Fliegel, Ph.D.
Thomas A. Olson
D. Brent Kenady
James L. Price
* Patent Agent
* Admitted in MI Only

Greek Wells (1897-1980)

August 11, 1999

Of Counsel
Richard J. St. John
David P. Roberts

Ms. Monica Kesling
Micron Communications, Inc.
8000 South Federal Way
Boise, ID 83706-9632

FIRST REMINDER

Aug 25, 1999

Re: U.S. Patent Application
"Remote Communication Devices, Radio Frequency
Identification Devices, Wireless Communication Systems,
Wireless Communication Methods, Radio Frequency
Identification Device Communication Methods, and
Methods of Forming a Remote Communication Device"
Your Reference: 97-1389
Our Reference: MI40-195

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*Ms. Monica Kesling
August 11, 1999*

*Wells, St. John, Roberts,
Gregory & Matkin P.S.*

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Very truly yours,



James D. Shaurette

JDS:plp

Enclosures: Draft Patent Application and Drawings; Declaration; Assignment; Power of Attorney by Assignee

Copy:

Freddie W. Smith (w/application and drawings)

Dirgha Khatri (w/application and drawings)

Michael L. Lynch, Esq. (w/application and drawings)